What is claimed is:

1. A method for transmitting optical signals through free space, comprising:

emitting a broad, divergent beam from a transmit aperture, wherein the beam has a diameter at the transmit aperture that is less than an inner scale near the transmit aperture.

2. A method, as claimed in Claim 1, wherein the air current is at or near the transmit aperture.

3. A method, as claimed in Claim 1, wherein the beam has an angle of divergence of from about 50 to about 2,000 μr.

4. A method, as claimed in Claim 1, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 50 microradians of the beam.

5. A method, as claimed in Claim 1, wherein the beam has a diameter that is less than an inner scale of the air turbulence.

6. A method, as claimed in Claim 1, wherein the beam has a diameter that is from about 5 to about 20% of a distance to a heat emitting surface adjacent to the transmit aperture.

7. A method, as claimed in Claim 1, wherein the beam diameter ranges from about 1 to about 10mm.

8. A method, as claimed in Claim 1, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 20 microradiants of the beam.

9. A method, as claimed in Claim 1, further comprising:

receiving the beam at a receiver; and

focusing a plurality of optical wavelengths at a corresponding plurality of spatially discrete locations, a respective optical detector being positioned at or near each location.

10. A method, as claimed in Claim 9, further comprising:

passing a first optical wavelength through a first immersion lens to form further focused first radiation; and

receiving the further focused first radiation with a first optical detector.

11. An optical transmission apparatus, comprising:

a radiation source for emitting a beam of radiation through free space;

a modulator in communication with the radiation source for modulating the beam with information;

a transmit aperture, wherein the transmit aperture has a size sufficient to output a maximum beam diameter that is less than an inner scale of an air current at or near the transmit aperture.

12. An apparatus, as claimed in Claim 11, wherein the beam diameter ranges from about 2 to about 10 mm.

13. An apparatus, as claimed in Claim 11, wherein the transmit aperture outputs a collimated beam of radiation.

14. An apparatus, as claimed in Claim 11, wherein the air current is at or near the transmit aperture.

15. An apparatus, as claimed in Claim 11, wherein the beam has an angle of divergence of from about 20 to about 2,000 μr.

16. An apparatus, as claimed in Claim 11, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 50 microradiants of the beam.

17. An apparatus, as claimed in Claim 11, wherein the beam has a diameter that is less than an inner scale of the air turbulence.

18. An apparatus, as claimed in Claim 11, wherein the beam has a diameter that is from about 5 to about 20% of a distance to an adjacent heat emitting surface.

19. An apparatus, as claimed in Claim 11, wherein the beam diameter ranges from about 1 to about 10mm.

20. An apparatus, as claimed in Claim 11, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 50 microradians of the beam.

21. An apparatus, as claimed in Claim 11, further comprising:

an optical receiver operable to receive the beam, the optical receiver comprising a plurality of optical detectors and a diffractive optical element operable to focus a plurality of optical wavelengths at a corresponding plurality of spatially discrete locations, wherein

a respective optical detector is positioned at or near each location to detect the corresponding focused optical wavelength.

22. An apparatus, as claimed in Claim 21, wherein the optical receiver further comprises at least a first immersion lens operable to focus first radiation of a first wavelength to form further focused first radiation, wherein the further focused first radiation is thereafter received by a respective first optical detector.

23. An optical transmission apparatus, comprising:

a radiation source;

a modulator in communication with the radiation source for modulating a beam output by the radiation source with information;

a transmit aperture, wherein the transmit aperture causes the beam to be divergent.

24. An apparatus, as claimed in Claim 23, wherein the aperture size produces a maximum beam diameter that is less than an inner scale of an air current at or near the transmit aperture

25. An apparatus, as claimed in Claim 23, wherein the beam diameter ranges from about 2 to about 10 mm.

26. An apparatus, as claimed in Claim 23, wherein the beam of radiation has an angle of divergence ranging from about 50 μr to about 2000 μr.

27. An apparatus, as claimed in Claim 24, wherein the air current is at or near the transmit aperture.

28. An apparatus, as claimed in Claim 23, wherein the beam has an angle of divergence of from about 20 to about 2,000 μr.

29. An apparatus, as claimed in Claim 23, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 50 microradiants of the beam.

30. An apparatus, as claimed in Claim 24, wherein the beam has a diameter that is less than an inner scale of the turbulence.

31. An apparatus, as claimed in Claim 24, wherein the beam has a diameter that is from about 5 to about 20% of a distance to a heat emitting surface adjacent to the aperture.

32. An apparatus, as claimed in Claim 24, wherein the beam diameter ranges from about 1 to about 10mm.

33. An apparatus, as claimed in Claim 23, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 20 microradiants of the beam.

34. An apparatus, as claimed in Claim 23, further comprising:

an optical receiver operable to receive the beam, the optical receiver comprising a plurality of optical detectors and a diffractive optical element operable to focus a plurality of optical wavelengths at a corresponding plurality of spatially discrete locations, wherein

a respective optical detector is positioned at or near each location to detect the corresponding focused optical wavelength.

35. An apparatus, as claimed in Claim 34, wherein the optical receiver further comprises at least a first immersion lens operable to focus first radiation onto a smaller detector than what could be achieved in air.

36. A method for designing an optical transmitter, comprising:

determining an inner scale at a proposed location for a transmit aperture; and

selecting a transmit aperture size sufficient to output a maximum beam diameter that is less than the inner scale.

37. An apparatus, as claimed in Claim 36, further comprising:

selecting the transmit aperture to produce a collimated beam.

38. An apparatus, as claimed in Claim 37, wherein the angle of divergence of the beam ranges from about 0.1 mrad to about 2.0 mrad.

39. A method, as claimed in Claim 36, wherein the beam has a diameter that is less than a Fresnel length of the air current.

40. A method, as claimed in Claim 36, wherein the beam has a diameter that is from about 5 to about 20% of a distance to a heat emitting surface adjacent to the transmit aperture.

41. A method, as claimed in Claim 36, wherein the beam diameter ranges from about 1 to about 10mm.

42. A method, as claimed in Claim 36, wherein an optical receiver is positioned relative to the beam such that the receive aperture of the optical receiver subtends at least about 20 microradiants.